

REMARKS

Summary of the Office Action

In the Office Action, claims 1, 3, 5-9, 11, and 13-16 were rejected under 35 U.S.C. § 112, second paragraph as being indefinite.

Claims 1, 3, 5, 6, 8, 9, 11, 13, 14, and 16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,606,438 to *Margalit et al.* in view of U.S. Patent No. 4,671,814 to *Aratani et al.*

Claims 7 and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Margalit et al.* in view of *Aratani et al.* as applied to claims 1, 3, 5, 6, 8, 9, 11, 13, 14, and 16 in further view of U.S. Patent No. 5,260,174 to *Nakazawa et al.*

Summary of the Response to the Office Action

Applicant amends claims 1 and 9. Claims 1, 3, 5-9, 11, 13-17 and 20-22 are pending in this application, with claims 17 and 20-22 being withdrawn.

All Subject Matter Complies With 35 U.S.C. § 112

The Office Action indicates that claims 1, 3, 5-9, 11, and 13-16 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. The Office Action states that the features describing compressive stress and configuration are unclear. This rejection is respectfully traversed.

The Examiner is thanked for the suggestions provided for overcoming the rejection under 35 U.S.C. § 112, second paragraph. By this Amendment, Applicant amends the claims in accordance with the Examiner's suggestion. It is respectfully submitted that the scope of the claims is unchanged or in some respects broadened by the amendments. The Office Action also asserts that the "transparent protective layer . . . that is configured such that it

imparts a compressive stress to the outer surface of one of the first and second substrate,” feature recited in independent claims 1 and 9 is indefinite because it is unknown whether or not the compressive stress is a “net” compressive stress. Applicant respectfully submits that the description of the invention in the specification would allow one of ordinary skill in the art to understand the meaning of the claimed “compressive stress” feature. Specifically, the compressive stress is described at least in the Summary of the Invention at page 4 and at page 7 of the Detailed Description of the Invention. Claims 1 and 9 indicate that a compressive stress is imparted to the “outside surface” of the first and second substrate by a protective layer. The outside surface of the first and second substrate is caused to be in compression by the protective layer formed on it. It is respectfully submitted that one skilled in the art would understand the metes and bounds of the claim term compressive stress in view of the background provided in the specification and the general state of knowledge in the art. Accordingly, Applicant respectfully requests that the rejection of claims 1, 3, 5-9, 11, and 13-16 under 35 U.S.C. § 112, second paragraph, should be withdrawn.

The Claims Define Allowable Subject Matter

Claims 1, 3, 5, 6, 8, 9, 11, 13, 14, and 16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Margalit et al.* in view of *Aratani et al.* Applicant respectfully traverses the rejections for the following reasons.

In regards to independent claims 1 and 9, Applicant respectfully submits that neither *Margalit et al.* nor *Aratani et al.* teach or suggest “at least one transparent protective layer formed on an outer surface of at least one of the first substrate and the second substrate, wherein the protective layer has a configuration which imparts a compressive stress to the

outer surface of at least one of the first substrate and second substrate,” as recited in claims 1 and 9.

Margalit et al. discloses a liquid crystal display (LCD) sandwich (30, 31), a layer of adhesive material (35) that extends continuously across a surface of the LCD sandwich, and a layer of rigid transparent material (*e.g.*, glass or acrylic) that is mounted facing the LCD sandwich and is bonded to the LCD sandwich by the layer of adhesive material. See the *Margalit et al.* Abstract.

Aratani et al. discloses a method of chemically strengthening glass formed of sheet glass produced by the float process. The strengthening method includes a known ion exchange process where alkali metal ions in the surface of the glass are exchanged with other alkali metal ions.

Neither *Margalit et al.* nor *Aratani et al.* teach or suggest, whether alone or in combination, at least the “transparent protective layer formed on an outer surface of at least one of the first substrate and the second substrate, wherein the protective layer has a configuration which imparts a compressive stress to the outer surface of at least one of the first substrate and second substrate” feature recited in claims 1 and 9. This feature is simply absent from both references. *Margalit et al.* utilizes an adhesive layer (35) to affix the acrylic or glass layers to the outside surfaces of the LCD sandwich (30, 31). No transparent protective layer is “formed on” the outer surface of the substrate as recited in claims 1 and 9. Further, *Aratani et al.* does not teach or suggest forming a transparent protective layer onto to a glass substrate that has a configuration which imparts compressive stress to the outer surface of the substrate.

Applicant respectfully submits that the Office Action has not established a *prima facie* case of obviousness and therefore all rejections under 35 U.S.C. § 103(a) should be withdrawn. To establish a *prima facie* case of obviousness, three basic criteria must be met (see MPEP §§ 2142-2143). First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill the art, to combine reference teachings. Second, there must be a reasonable expectation of success. Third, the prior art references must teach or suggest all the claim limitations.

As demonstrated above, the Office Action has not established a *prima facie* case of obviousness at least because neither *Margalit et al.* nor *Aratani et al.*, either alone or in combination, teach or suggest all the recited features of independent claims 1 and 9. Namely, neither *Margalit et al.* nor *Aratani et al.* teach or suggest at least a “at least one transparent protective layer formed on an outer surface of at least one of the first substrate and the second substrate, wherein the protective layer has a configuration which imparts a compressive stress to the outer surface of at least one of the first substrate and second substrate.” Therefore, Applicant respectfully asserts that the rejection under 35 U.S.C. § 103(a) should be withdrawn. Additionally, it is further respectfully submitted that dependent claims 3, 5, 6, 8, 11, 13, 14, and 16 are also allowable insofar as they recite the patentable combinations of features recited in independent claims 1 and 9, as well as reciting additional features that further distinguish over the applied art.

Claims 7 and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Margalit et al.* in view of *Aratani et al.* as applied to claims 1, 3, 5, 6, 8, 9, 11, 13, 14, and 16 in further view of *Nakazawa et al.* Applicant respectfully traverses the rejections for the following reasons.

In regards to independent claims 7 and 15, Applicant respectfully asserts that neither *Margalit et al.*, *Aratani et al.*, nor *Nakazawa et al.*, either alone or in combination, teach or suggest the present invention. As demonstrated above neither *Margalit et al.* nor *Aratani et al.* teach or suggest at least a “at least one transparent protective layer formed on an outer surface of at least one of the first substrate and the second substrate, wherein the protective layer has a configuration which imparts a compressive stress to the outer surface of at least one of the first substrate and second substrate,” as recited in independent claims 1 and 9. Applicant respectfully submits that *Nakazawa et al.* does not make up for the deficiencies of *Margalit et al.* and *Aratani et al.*.

Nakazawa et al. discloses a square substrate for use in the production of a color filter for a liquid crystal display (LCD). The substrate is placed with a surface extending horizontally and a viscous liquid (e.g., acrylic resin) is dropped on the surface in a line along an edge portion of the surface. A squeeze rod is moved along the surface with a predetermined gap maintained between the squeeze rod and the surface to spread the viscous liquid over at least part of the surface, whereby a predetermined viscous liquid thickness is obtained. Thereafter, the substrate is spun in the plane of the surface thereof to disperse the viscous liquid uniformly by centrifugal force over the entire surface of the substrate, whereby a thin coating of the liquid with uniform thickness is formed on the surface of the substrate.

See the *Nakazawa et al.* Abstract.

Nakazawa et al. does not disclose or teach at least the feature of a “at least one transparent protective layer formed on an outer surface of at least one of the first substrate and the second substrate, wherein the protective layer has a configuration which imparts a compressive stress to the outer surface of at least one of the first substrate and second

substrate,” as recited in independent claims 1 and 9. Rather, *Nakazawa et al.* discloses a method and apparatus for obtaining a colored filter made of a resin layer. See the *Nakazawa et al.* specification at column 2, lines 15-19 and column 3, lines 24-259. *Nakazawa et al.* does not teach that its colored filters are formed on glass substrates or impart a compressive stress to an underlying substrate’s outer surface.

On the contrary, the invention of claim 1 includes a protective layer, which is “formed on” a glass substrate, and “imparts” a compressive stress on the glass substrate. The tensile stress of the protective layer compresses the outer surface of the glass substrate. Compression of the outer surface of the glass substrate may result in less stress fractures (cracks). Because the outer surface of the glass substrate is compressed, the propagation of cracks with impurities in them may also be prevented. Further, the protective layer may prevent additional impurities from coming into contact with the glass substrate, thus improving its optical properties.

Therefore, since none of the references of record, either alone or in combination, teach or suggest all the claimed features, it is respectfully submitted that the present invention is not obvious. Accordingly, it is respectfully requested that the rejections of claims 7 and 15 under U.S.C. § 103(a) as being obvious over *Margalit et al.* in view of *Aratani et al.* as applied to claims 1, 3, 5, 6, 8, 9, 11, 13, 14, and 16 and in further view of *Nakazawa et al.*, be withdrawn.

CONCLUSION

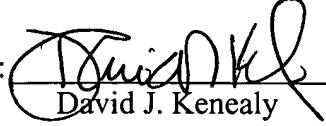
Applicant respectfully submits that all pending claims are now in condition for allowance. An early notice to this effect is earnestly solicited. Should there be any questions regarding the application, the Examiner is invited to contact the undersigned representative to expedite prosecution.

If there are any other fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-0310. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such an extension is requested, and the fee should also be charged to our Deposit Account.

Attached hereto is a marked-up version of the changes made to the claims by the current Amendment. The attached page is captioned "**VERSIONS WITH MARKINGS TO SHOW CHANGES MADE.**"

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN CLAIMS:

Claims 1 and 9 have been amended as follows:

1. (Three Times Amended) A glass substrate of a liquid crystal display device, comprising:
 - a first substrate and a second substrate; and
 - at least one transparent protective layer formed on an outer surface of at least one of the first substrate and the second substrate [~~that is configured such that it~~] , wherein the protective layer has a configuration which imparts a compressive stress to the outer surface of at least one of the first substrate and second substrate.

9. (Three Times Amended) A liquid crystal display device, comprising:
 - a first substrate and a second substrate;
 - at least one transparent protective layer formed on an outer surface of at least one of the first substrate and the second substrate [~~that is configured such that it~~] , wherein the protective layer has a configuration which imparts a compressive stress to the outer surface of at least one of the first substrate and second substrate;
 - a transparent electrode formed on an inner surface of the first substrate or the second substrate;
 - an alignment layer formed on the transparent electrode; and
 - a liquid crystal layer between the first substrate and the second substrate.